7.0 CUMULATIVE EFFECTS

Cumulative effects, as defined in 50 CFR Section 402.02, include the effects of future state, Tribal, local, or private actions, not involving Federal activities, that are reasonably certain to occur within the action area (described in Section 1). Future Federal actions requiring separate consultations pursuant to Section 7 of the ESA are not considered here.

State, Tribal, and local government actions are likely to be in the form of legislation, administrative rules, or policy initiatives. Government and private actions may include changes in land and water use patterns, including ownership and intensity, any of which could affect listed species or their habitat. Even actions that are already authorized are subject to political, legislative, and fiscal uncertainties. These realities, added to the geographic scope of the action area, which encompasses numerous government entities exercising various authorities and many private landholdings, make any analysis of cumulative effects difficult and even speculative. This section identifies representative actions that, based on currently available information, are reasonably certain to occur. It also identifies goals, objectives and proposed plans by state and Tribal governments, however, NMFS is unable to determine at this point in time whether such proposals will in fact result in specific actions.

7.1 STATE ACTIONS

Regional

Each state in the Columbia River basin administers the allocation of water resources within its borders. Water resource development has slowed in recent years. Most arable lands have already been developed, the increasingly diversified regional economy has decreased demand, and there are increased environmental protections. If, however, substantial new water developments occur, cumulative adverse effects to listed fish are likely. NMFS cooperates with the state water resource management agencies in assessing water resource needs in the Columbia River basin. Through restrictions in new water developments, vigorous water markets may develop to allow existing developed supplies to be applied to the highest and best use. Interested parties have applied substantial pressure, including ongoing litigation, on the state water resource management agencies to reduce or eliminate restrictions on water development. It is, therefore, impossible to predict the outcomes of these efforts with any reasonable certainty.

In July 2000, the governors of Idaho, Montana, Oregon, and Washington released their "Recommendation for the Protection and Restoration of Fish in the Columbia River Basin," with the stated goal of "protection and restoration of salmonids and other aquatic species to sustainable and harvestable levels meeting the requirements of the Endangered Species Act, the Clean Water Act, the Northwest Power Act and tribal rights under treaties and executive orders while taking into account the need to preserve a sound economy in the Pacific Northwest." The recommendations include the following general actions:

1. **Habitat Reforms**
   a) Designate priority watersheds for salmon and steelhead.
   b) Provide local watershed planning assistance and develop the priority plans by October 1, 2002, and for all Columbia River basin watersheds by 2005.
   c) Integrate Federal, state, and regional planning processes with the NWPPC's amended Fish and Wildlife Program.
   d) Cooperate with Federal, Tribal, and local governments to implement the National Estuary Program for the lower Columbia River estuary, including creation of salmon sanctuaries.
2. **Harvest Reforms**
   a) Research the use of more selective fishing techniques and a license buyback program.
   b) Increase harvest selectivity through restrictions of harvest rates, gear, and timing for commercial and non-Treaty sport fisheries, consistent with ensuring survival of the species when combined with other recovery actions.
   c) Establish terminal fisheries below Bonneville Dam and in zone 6.
   d) Strengthen state law enforcement programs and coordinate them with habitat strategies to aid specific watersheds.
   e) Increase fishing opportunities for species that prey on, and compete with, salmon for food.
3. **Hatchery Reforms**
   a) Implement reforms recommended in the NWPPC's 1999 Artificial Production Review Report to congress.
   b) Support the region's fish managers and the Tribes' development of a comprehensive supplementation plan that includes intensive monitoring and evaluation.
   c) Mark hatchery fish that pose threats to listed fish, consistent with the Pacific Salmon Treaty.
4. **Funding and Accountability**
   a) Seek funding assistance for existing activities designed to improve ecosystem health and fish and wildlife health and protection.
   b) Work regionally to create a standardized and accessible information system to document regional recovery progress.

If these recommendations are implemented by the states individually and collectively, they should have beneficial effects on listed species and their habitat.

Oregon

Most future actions by the state of Oregon are described in the Oregon Plan for Salmon and Watershed measures, which includes the following programs designed to benefit salmon and watershed health:

- Oregon Department of Agriculture water quality management plans
- Oregon Department of Environmental Quality development of total maximum daily loads (TMDLs) in targeted basins; implementation of water quality standards

- Oregon Watershed Enhancement Board funding programs for watershed enhancement programs, and land and water acquisitions
- ODFW and Oregon Water Resources Department (OWRD) programs to enhance flow restoration
- OWRD programs to diminish over-appropriation of water sources
- ODFW and Oregon Department of Transportation programs to improve fish passage; culvert improvements/replacements
- Oregon Department of Forestry state forest habitat improvement policies and the Board of Forestry pending rules addressing forestry effects on water quality and riparian areas
- Oregon Division of State Lands and Oregon Parks Department programs to improve habitat health on state-owned lands
- Department of Geology and Mineral Industries program to reduce sediment runoff from mine sites
- State agencies funding local and private habitat initiatives; technical assistance for establishing riparian corridors; and TMDLs

If the foregoing programs are implemented, they may improve habitat features considered important for the listed species. In November 2000, however, Oregon voters approved a broad constitutional amendment requiring payment to private property owners for diminution in property values resulting from regulations. That measure essentially puts all Oregon regulatory initiatives into question. The Oregon Plan also identifies private and public cooperative programs for improving the environment for listed species. The success and effects of such programs will depend on the continued interest and cooperation of the parties. One such cooperative program, the Willamette Restoration Initiative (WRI), has been charged with developing the Willamette basin section of the Oregon Plan. The future of the WRI will be subject to discussion among the WRI board, the Oregon governor's office, and the Oregon legislature in the 2001 legislative session.

Washington

The state of Washington has various strategies and programs designed to improve the habitat of listed species and assist in recovery planning. Washington's 1998 Salmon Recovery Planning Act provided the framework for developing watershed restoration projects and established a funding mechanism for local habitat restoration projects. It also created the Governor's Salmon Recovery Office to coordinate and assist in the development of salmon recovery plans. Washington's "Statewide Strategy to Recover Salmon," for example, is designed to improve watersheds.

The Watershed Planning Act, also passed in 1998, encourages voluntary planning by local governments, citizens, and Tribes for water supply and use, water quality, and habitat at the Water Resource Inventory Area or multi-Water Resource Inventory Area level. Grants are made available to conduct assessments of water resources and to develop goals and objectives for future water resources management. The Salmon Recovery Funding Act established a board to localize salmon funding. The board will deliver funds for salmon recovery projects and activities

based on a science-driven, competitive process. These efforts, if developed into actual programs, should help improve habitat for listed species.

Washington's Department of Fish and Wildlife and tribal comanagers have been implementing the Wild Stock Recovery Initiative since 1992. The comanagers are completing comprehensive species management plans that examine limiting factors and identify needed habitat activities. The plans also concentrate on actions in the harvest and hatchery areas, including comprehensive hatchery planning. The department and some western Washington treaty Tribes have also adopted a wild salmonid policy to provide general policy guidance to managers on fish harvest, hatchery operations, and habitat protection and restoration measures to better protect wild salmon runs.

Washington State's Forest and Fish Plan may be promulgated as administrative rules. The rules are designed to establish criteria for non-Federal and private forest activities that will improve environmental conditions for listed species. The Washington legislature may amend the Shoreline Management Act, giving options to local governments for complying with endangered species requirements in marine areas.

The state is also establishing the Lower Columbia Fish Recovery Board to begin drafting recovery plans for the lower Columbia region. The future impacts of the board's efforts will depend on legislative and fiscal support. The Washington Department of Transportation is considering changing its construction and maintenance programs to diminish effects on stream areas and to improve fish passage. The program may qualify for a limit under NMFS' 4(d) rule to conserve listed species.

Water quality improvements will be proposed through development of TMDLs. The state of Washington is under a court order to develop TMDL management plans on each of its 303(d) water-quality-listed streams. It has developed a schedule that is updated yearly; the schedule outlines the priority and timing of TMDL plan development.

Washington State closed the mainstem Columbia River to new water rights appropriations in 1995. All applications for new water withdrawals are being denied based on the need to address ESA issues. The state established and funds a program to lease or buy water rights for instream flow purposes. This program was started in 2000 and is in the preliminary stages of public information and identification of potential acquisitions. These water programs, if carried out over the long term, should improve water quantity and quality in the state.

As with Oregon's state initiatives, Washington's programs are likely to benefit listed species if they are implemented and sustained.

Idaho

The Idaho Department of Environmental Quality will establish TMDLs in the Snake River basin, a program regarded as having positive water quality effects. The TMDLs are required by court

order, so it is reasonably certain that they will be set. However, the same agency is considering relaxing other water quality standards in Idaho streams, which could have negative effects on water quality.

The state of Idaho has created an Office of Species Conservation to work on subbasin planning and to coordinate the efforts of all state offices addressing natural resource issues. The state actions targeted by this office include the following:

1. Continue diversion screening, in cooperation with BPA and BOR
2. Improve flow augmentation for fish passage through state programs
3. Implement the Forest Practices Act to maintain forest tree species, soil, air, and water resources and provide a habitat for wildlife and aquatic life.
4. Complete cumulative watershed effects assessments on more than 100 watersheds to support watershed planning.
5. Require 30-foot buffers along Class II streams.

These state-directed actions, if continued, will have positive effects for listed species and their habitat.

Demands for Idaho's groundwater resources have caused groundwater levels to drop and reduced flow in springs for which there are senior water rights. The Idaho Department of Water Resources has begun studies and promulgated rules that address water right conflicts and demands on a limited resource. The studies have identified aquifer recharge as a mitigation measure with the potential to affect the quantity of water in certain streams, particularly those essential to listed species.

Montana

Montana is expected to undertake the following future state actions to benefit listed species in the Columbia River basin.

Under the State Water Quality Act, the Montana Department of Environmental Quality (MDEQ) is required to ensure that water quality restoration plans and permits are developed by 2007 for all waters on the 303 (d) list and within 10 years for any new water body added to the list. As part of the water quality restoration process, MDEQ and other agencies may provide financial grants to local water quality groups to implement pollution control measures. For non-point pollution sources, MDEQ plans to provide technical and financial support to local and regional watershed groups and allow them to take the lead in monitoring, developing plans, and implementing pollution controls. MDEQ's Remediation Division identifies water quality problems related to mining or other sources and coordinates cleanups with other resource management activities. This action may be part of a watershed restoration project carried out by local authorities.

Montana is implementing a new TMDL program to assess the quality of its water bodies and systematically implement water quality plans to restore and protect them. The plan calls for developing TMDLs for each of the 800 impaired water bodies on the 303 (d) list. Local watershed groups are asked to take responsibility for their own watersheds and work directly with MDEQ to develop TMDLs. These local watershed groups will also participate in the ranking and priority-setting process for watershed improvements to benefit listed species.

General

In the past, each state's economy depended on natural resources, with intense resource extraction. Changes in the states' economies have occurred in the last decade and are likely to continue, with less large-scale resource extraction, more targeted extraction, and significant growth in other economic sectors. Growth in new businesses, primarily in the technology sector, is creating urbanization pressures and increased demands for buildable land, electricity, water supplies, waste-disposal sites, and other infrastructure.

Economic diversification has contributed to population growth and movement in all four states, a trend likely to continue for the next few decades. Such population trends will result in greater overall and localized demands for electricity, water, and buildable land in the action area; will affect water quality directly and indirectly; and will increase the need for transportation, communication, and other infrastructure. The impacts associated with these economic and population demands will probably affect habitat features such as water quality and quantity, which are important to the survival and recovery of the listed species. The overall effect will be negative, unless carefully planned for and mitigated.

Some of the state programs described above are designed to address these impacts. Oregon also has a statewide, land-use-planning program that sets goals for growth management and natural resource protection. Washington State enacted a Growth Management Act to help communities plan for growth and address the effects of growth on the natural environment. If the programs continue, they may help lessen the potential for the adverse effects discussed above.

7.2 LOCAL ACTIONS

Local governments will be faced with similar and more direct pressures from population growth and movement. There will be demands for intensified development in rural areas, as well as increased demands for water, municipal infrastructure, and other resources. The reaction of local governments to growth and population pressure is difficult to assess without certainty in policy and funding. In the past, local governments in the three states generally accommodated growth in ways that adversely affected listed fish habitat. Because there is little consistency among local governments regarding current ways of dealing with land use and environmental issues, both positive and negative effects on listed species and their habitat are probably scattered throughout the action area.

In both Oregon and Washington, local governments are considering ordinances to address effects on aquatic and fish habitat from different land uses. The programs are part of state planning structures; however, local governments in Oregon are likely to be cautious about implementing new programs, because of the passage of the constitutional amendment discussed above. Some local government programs, if submitted, may qualify for a limit under NMFS' 4(d) rule, which is designed to conserve listed species. Local governments may also participate in regional watershed health programs, although political will and funding will determine participation and, therefore, the effect of such actions on listed species. Overall, unless beneficial programs are comprehensive, cohesive, and sustained in their application, it is not likely that local actions will have measurable positive effects on listed species and their habitat and may even contribute to further degradation.

7.3 TRIBAL ACTIONS

Tribal governments will participate in cooperative efforts involving watershed and basin planning designed to improve aquatic and fish habitat. The results of changes in Tribal forest and agricultural practices, in water resource allocation, and in land use are difficult to assess, for the reasons discussed in Sections 7.1 and 7.2. The earlier discussion of the effects of economic diversification and growth applies also to Tribal government actions. The Tribal governments have to apply and sustain comprehensive and beneficial natural resource programs such as the ones described below, to areas under their jurisdiction to have measurable positive effects on listed species and their habitat.

One Tribal program illustrates future Tribal actions that should have such positive effects. The *Wy-Kan-Ush-Mi Wa-Kish-Wit*, or "Spirit of the Salmon" plan is a joint restoration plan for anadromous fish in the Columbia River basin prepared by the Nez Perce, Umatilla, Warm Springs and Yakama Tribes. It provides a framework for restoring anadromous, or sea-going, fish stocks, specifically salmon, Pacific lamprey (eels), and white sturgeon in upriver areas above Bonneville Dam. The plan's objectives are as follows:

1. Halt the decline of salmon, lamprey, and sturgeon populations above Bonneville Dam within 7 years.
2. Rebuild salmon populations to annual run sizes of 4 million above Bonneville Dam within 25 years in a manner that supports Tribal ceremonial, subsistence, and commercial harvests.
3. Increase lamprey and sturgeon to naturally sustaining levels within 25 years in a manner that supports Tribal harvests.

The plan emphasizes strategies and principles that rely on natural production and healthy river systems. The plan's technical recommendations cover hydro operations on the mainstem Columbia and Snake rivers; habitat protection and rehabilitation in the basin above Bonneville Dam, in the Columbia estuary, and in the Pacific ocean; fish production and hatchery reforms; and inriver and ocean harvests.

The Nez Perce, Warm Spring, Umatilla, and Yakama Tribal governments are now seeking to implement this plan and salmon restoration in conjunction with the states, other Tribes, and the Federal government, as well as in cooperation with their neighbors throughout the basin's local watersheds and with other citizens of the Northwest.

Overall, the Spirit of the Salmon plan should have positive cumulative effects on listed species and their habitat.

7.4 PRIVATE ACTIONS

The effects of private actions are the most uncertain. Private landowners may convert their lands from current uses, or they may intensify or diminish those uses. Individual landowners may voluntarily initiate actions to improve environmental conditions, or they may abandon or resist any improvement efforts. Their actions may be compelled by new laws, or they may result from growth and economic pressures. Changes in ownership patterns will have unknown impacts. Whether any of these private actions will occur is highly unpredictable, and the effects are even more so.

7.5 SUMMARY

Non-Federal actions are likely to continue affecting listed species. The cumulative effects in the action area are difficult to analyze, considering the broad geographic landscape covered by this opinion, the geographic and political variation in the action area, the uncertainties associated with government and private actions, and ongoing changes to the region's economy. Whether those effects will increase or decrease in the future is a matter of speculation; however, based on the population and growth trends identified in this section, cumulative effects are likely to increase. Although state, Tribal, and local governments have developed plans and initiatives to benefit listed salmon and steelhead, they must be applied and sustained in a comprehensive manner before NMFS can consider them "reasonably foreseeable" in its analysis of cumulative effects.